Please replace paragraph [0042] with the following:

--Figure 11B is a 2D cartilage thickness map demonstrating abrupt decrease in cartilage thickness in an area of the defect (arrows). The) thickness between the neighboring pixels can be used to define the borders of the cartilage defect. Note defused cartilage thinning in the area enclosed by the asterisks (*).--

Please replace paragraph [0043] with the following:

--Figures 10A-10C show a 3D surface registration of femoral condyles based on T1-weighted Spin-Echo MR images. Figure 10A is baseline with a knee in neutral position. Figure 10B is a follow-up with knee and external rotation with a 3D view that is the identical to the one used in 10A but the difference in knee rotation is apparent. In Figure 10C, transformation and re-registration of Scan Bin to the object coordinate system of Scan A shows the anatomic match to A is excellent.--

In the claims:

Please amend the claims as follows:

Please cancel claims 1-33, without prejudice or disclaimer.

Please add new claims 34-60 as follows:

--34. (New) A method of assessing the change of cartilage in a joint of a mammal over time, the method comprising the steps of

(a) determining the thickness, width, area or volume of a region of cartilage at an initial time T_1;

(b) determining the thickness, width, area or volume of the region of cartilage at a later time T_2; and

(c) determining the change in the thickness, width, area or volume of the region of cartilage between the initial and the later times.

35. (New) The method of claim 34, wherein the steps (a) and (b) comprise obtaining a three-dimensional map of the region of cartilage.

44. (New) The method of claim 34, wherein the thickness, width, area or volume of the region of cartilage is obtained from a magnetic resonance imaging (MRI) technique.

45. (New) The method of claim 44, wherein the MRI technique includes placing external markers on the skin overlaying the bone on either side of the joint.

46. (New) The method of claim 44, wherein the MRI technique first obtains a series of two-dimensional views of the joint, which are then mathematically integrated to give a three-dimensional image.

47. (New) The method of claim 44, wherein the MRI technique employs a gradient echo, spin echo, fast-spin echo, driven equilibrium fournier transform, spoiled gradient echo or steady state free precession technique.

48. (New) A method of making a three-dimensional map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises

(a) measuring a detectable biochemical component;

(b) determining the relative amounts of the biochemical component; and

(c) mapping the amounts of the biochemical component in three dimensions, thereby making a three-dimensional map of joint cartilage.

49. (New) The method of claim 48, further comprising the step of determining the areas of abnormal joint cartilage by identifying the areas having altered amounts of the biochemical component present.

50. (New) The method of claim 48, wherein the biochemical component are glycosaminoglycan, sodium, water or hyaluronic acid.

51. (New) The method of claim 48, wherein the joint is a knee joint.

52. (New) The method of claim 51, wherein the mammal is a human.

36. (New) The method of claim 34, further comprising the steps of:

electronically transferring an electronically-generated image comprising the cartilage from a transferring device to a receiving device located distant from the transferring device;

receiving the transferred image at the distant location; and

converting the transferred image to a degeneration pattern.

37. (New) The method of claim 36, wherein the joint is from a human and wherein the method further comprises the step of generating a movement pattern for the joint of the human from a database accessible to the distant location, wherein the database includes a collection of movement patterns of human joints, which patterns are organized and are accessed by reference to characteristics such as type of joint, gender, age, height, weight, bone size, type of movement, and distance of movement.

38. (New) The method of claim 37, wherein the movement pattern is of a human walking, running, stair-climbing, stepping onto/off of a platform, or jumping.

39. (New) The method of claim 37, wherein the movement pattern and the electronically-generated image are merged to show how the movement pattern interacts with the electronically-generated image.

40. (New) The method of claim 34, wherein the volume of the cartilage loss is assessed by

determining the thickness, D_N, of the normal cartilage near the cartilage defect;

obtaining the thickness of the cartilage defect, D_D, of the region;

subtracting $_{DD}$ from D_N to give the thickness of the cartilage loss, D_L;

determining the area of the cartilage defect A_D; and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

41. (New) The method of claim 40, wherein the region of the cartilage defect includes a portion of the cartilage contiguous to the defect.

42. (New) The method of claim 34, wherein the joint is a knee joint.

43. (New) The method of claim 34, wherein the mammal is a human.

53. (New) The method of claim 50, wherein measuring of the biochemical component is done using a magnetic resonance imaging (MRI) technique.

54. (New) The method of claim 53, wherein the MRI technique includes placing external markers on the skin overlaying the bone on either side of the joint.

55. (New) The method of claim 53, wherein the MRI technique first obtains a series of two-dimensional views of the joint, which are then mathematically integrated to give a three-dimensional image.

56. (New) The method of claim 55, wherein the MRI technique employs a gradient echo, spin echo, fast-spin echo, driven equilibrium fournier transform, spoiled gradient echo or steady state free precession technique.

57. (New) A method of estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, the method comprising the steps of

(a) defining a 3D object coordinate system of the joint at an initial time, T_1;

(b) identifying a region of a cartilage defect or diseased cartilage within the 3D object coordinate system;

(c) defining a volume of interest around the region of the cartilage defect or diseased cartilage whereby the volume of interest is equal to or larger than the region of cartilage defect or diseased cartilage, but does not encompass the entire articular cartilage;

(d) defining the 3D object coordinate system of the joint at a second timepoint, T_2;

(e) placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1; and

(f) measuring any differences in cartilage within the volume of interest between timepoints T_1 and T_2.

58. (New) The method of claim 57, wherein the joint is a knee joint.

59. (New) The method of claim 57, wherein the mammal is a human.

60. (New) The method of claim 57, wherein measuring the differences shows a loss of the cartilage between T_1 and T_2.--

Attached hereto is a **version showing changes made to the specification**; a **version showing changes made to the claims**; and **a currently pending claim set**.